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V. An account of Books. I. *Astronomiae Physicae & Geometriae Elementa.* Auctore Davide Gregorio, M. D. Astronomiae Professore Saviliano & R. S. S. Oxonie, 1702. fol.

WHAT the World has herto wanted, the Learned Dr *Gregory*, has supplied it with a compleat System of true and Physical Astronomy; and as the last Ages have been sufficiently furnished by the Ancients, with the Elements of Geometry, so without question the future will have recourse to this Book, for those of Physical and Geometrical Astronomy.

The Physical explications are all built upon the principles of the great Mr *Newton*; and he has, throughout the whole Work, so mixed these with the Phænomena's themselves, that they who are only sollicitous about the Astronomical part, may understand it, as it is there delivered, without inquiring into the Physical causes. The Geometrical parts are either all proved from the citations of standard Authors, or demonstrated in *Lemma's*, inserted in their respective places. And that the Reader may not think Physical Inquisitions in Astronomy to be only new, in his Preface he proves from *Diogenes Laertius*, *Plutarch*, *Stobæus*, &c. that the ancient Philosophers, besides their knowledge of the true System of the Universe, were not unacquainted with the real and Physical causes of the Planets Motions, and that universal Law of Nature from which they all spring, viz. that Matter attracts Matter in a reciprocal proportion of the square of the distance.

In the first Book the Author treats of the Order, Motions and Periods of the Primary Planets, and the chief appearances that arise from thence, as their Directions, Stations, Retrogradations, &c. the different phases of the inferior, like to those

those of the Moon, the Eclipses of both Sun and Moon ; and then he proves that the Primary Planets turn round the Sun ; and that the direction of their gravity is not towards the Earth, but towards the Sun, and that it is by that force of gravity, that they are kept from going out in right lines, and made to turn round in Orbit ; that this force of gravity decreases in each of them in the same proportion, that the square of the distance from the Sun or Center encreases ; as likewise, that all the Secundary Planets in turning round their Primary, are kept in their Orbit by the force of gravity, whose direction is towards the Centers of their respective Primaries, and that the accelerating force of this gravity, is in a reciprocal proportion of the square of the distance ; and that in the Moon it is the very same with the gravity of Bodies towards our Earth. Now, because we know by observations, that the Planets move not in Circles, but in Ellipses ; in one of whose *foci* the Sun is placed, there must necessarily be a particular Law of gravity acting towards the Sun, to make the Planet move in such Curves. This he inquires into, and finds it to be the very same with what he had before discovered, by comparing the distances of the Planets from the Sun with their Periodical Times.

Afterwards in the 7th Section, he proves, that this Law of attraction is universal of all Matter to Matter, and that it is the very same with Gravity ; and that the Sun and Planets mutually gravitating towards one another, must necessarily turn round their common Center of Gravity, which by reason of the vast bigness of the Sun, in respect of the rest, cannot be far from the Suns own Center. Now, since by this Law of attraction, the Moon must not only be drawn towards the Earth, but also towards the Sun ; and that differently, according as its distance and position varies ; he from thence, and the inclination of its Orbit to the plain of the Ecliptick, gives us the reason why the Nodes move backwards and upon the same account, their being as it were a redundant ring of Matter about the Earths Equator, he shows how the Aequinoctial points must necessarily constant.

ly go back a little, and make a procession of the Equinox.

Having thus settled the true causes of the Celestial Motions, he next enquires into the various opinions of Philosophers on that subject, and examines the *Physica Cœlestis* of Kepler, the *Vortices* of Cartesius, and those of the ingenious Monsieur Leibnits, whose several Theories he sufficiently confutes; and then he gives an account of the other three celebrated Systems of the Universe, the Ptolemaick, Tycho-nick and Semi-Tychonick, and the different forces that are necessary to make the Planets move in the order, which those Systems require.

In the 2d Book are explained all those things that depend upon the motion of the *Primum Mobile*, the Doctrine of the Sphere, the Genesis of the Circles, the use of the Globes, Spheres and other Instruments that are contrived to represent the Diurnal Motions of the Stars, together with the method of determining by observations the positions of the Circles in respect of each other, and the places of the Stars, their Longitudes, Latitudes, &c. the method of making Catalogues of the fixt Stars, with an Historical account of all those Catalogues that have been hitherto made. Here also he shows the way of solving all the common problems of the Sphere by Trigonometry, as also the foundation and method of making all sorts of Dyals by the same *Calculus*: And lastly the various Ways of determining the Parallax and Refractions of the Stars with their demonstrations.

In the 3d Book he descends more particularly to the Theory of the Primary Planets. And, because each Planet so moves in an Ellipse round the Sun, that it describes Areas always proportional to the times, he gives the methods of dividing the Area of an Ellipse by a Line drawn from its focus in a given proportion; which may be done either by the indirect method of Kepler, or directly by a Series of his own, which he demonstrates; and then he shows Dr Ward's Theory (wherein the Planets are supposed to describe about the other focus angles always proportional to the times) to

to be only an approximation to the true one, wherein they describe Area's at the other *focus* that are proportional to the times, and as such it is expressly mentioned by *Kepler* in his *Epitome Astronomiae Copernicanae*; but if the distance between the *foci* be great, this method will not give the exact place of the Planet, and therefore it wants the approximation of *Bullialdus*, which is only a nearer approach to truth. Here also he considers the Oval Figure, in which Monsieur. *Cassini* supposes the Planets to move; and he proves, that if a Planet moved in that Curve according to M. *Cassini*'s Theory, it would describe round the Sun equal Areas in equal times; and by consequence a Centripetal force of a determined kind acting upon the Planet, might make it describe this Curve; whereas Dr *Ward*'s Theory is Physically impossible, there being no Centripetal force towards the Sun, that can make them move in an Ellipse according to this Law; but then he tells us, that the Theory of *Cassini* does not answer observations, nor will give the true Anomaly of the Planet, and its distance from the Sun. After this he comes particularly to shew the methods of determining the Orbits of the Earth and Planets, their Excentricities, position of their Apsides and Nodes, and describes all the Tables that are necessary to calculate their motions, together with the manner of making them; and he also shews the way of finding out the Magnitudes, Densities and Figures of the Sun and Planets, and the distances of the fixt Stars, where he takes notice, that the annual different distances of a fixt Star from the Pole (which Mr *Flamsteed* in his Letter to Dr *Wallis*, Printed in the third Tome of the Drs Works, says, he has observed in the Polar Star) does not necessarily arise from their Parallax; but may proceed from other causes, so that from this observation, we cannot conclude the parallax of the fixed Stars, nor does it directly prove the motion of the Earth, which Mr *Flamsteed* thinks he has done by it. And it is the more likely, that this variation of the Stars distance from the Pole, observed by Mr *Flamsteed*, proceeds from some nutation, since the young

Mr *Cassini* has demonstrated, that in the Polar Star it cannot arise from the parallax of the *Magnus Orbis*; and our Author has given us good arguments to prove the fixt Stars to be at so great a distance, that the Diameter of the *Magnus Orbis* is insensible in respect of it.

Having thus established the Theory of the Primary Planets, in the 4th Book he gives us that of the Secundary, whose motions are much more composed and intricate than any of the first, theirs being only compounded of an uniform progressive motion forward, and that of Gravity, by which, as it were they are drawn toward the Sun; whereas the Secundaries are not only attracted towards their respective Primaries; but also towards the Sun, and that with the same accelerating force of Gravity as the Primaries, when at the same distance, with a greater force when nearer, and a lesser when further from the Sun, than the Primaries are. Which variety of the force of attraction, according to the various positions of the Secundaries Orbit, its inclination to the Orbit of its Primary, and the place of the Secundary in this Orbit, must necessarily produce various inequalities and irregularities in the motions of the Secundaries, all which he considers, at large, and from thence he explains the motions of the Apsides forwards, that of their Nodes backwards, the changeable inclination of the Orbits to the plains of their Primaries Orbits, the different velocities of the Secundaries, according as their position in respect of the Sun, and their Primaries vary; and he applics the whole to the motions of the Moon. All this, before the happy discoveries of that celebrated Philosopher Mr *Newton*, was not to be attempted by any Physical explication, the greatest advancement that was made, being only to solve them by an Astronomical Hypothesis. He also gives us an account of the Tables necessary to calculate the Moons place seen out of the Earth, and the manner of using them; and to this he joyns Mr *Newton's* own Theory of the Moon, which if used in practice, will determine her place nicely enough, even in the Quadratures, as has been found by comparing it with Mr *Flemsteed's* observations, where when the error

error is greatest it exceeds not two minutes, but for the most part it is so small, that it may be justly enough imputed to the uncertainty of observations. After this he treats more particularly of the Eclipses of both Sun and Moon, and the manner of Calculating them ; he gives an account of the Moons motion round its Axis, and shows how all those various nutations and librations of the Moon, that has hitherto so much puzzled the Philosophers, do only arise from its Menstruous uniform rotations round its Axis ; from thence he passes to the ways of determining the magnitudes, densities, and quantities of matter in the Secundary Planets, and the change of Figure both in the Primaries and them, that must necessarily arise if they are fluid from their mutual gravitation towards one another, from which he explains the Tydes and Motion of the Seas. He ends the Book with a description of the Ring of *Saturn*, and accounts for all its various appearances seen out of the Earth.

In the 5th Book the Author treats of Comets, where after having given the several opinions of Philosophers about their Place, Duration, Origine, Orbits and Tayls ; he tells us, that certainly they are Bodies that move round the Sun, and differ from the other Planets in that their Orbits are very oblong Ellipses, whereas the Planets describe Ellipses which come very near to Circles, and from this Hypothesis it is easy to give an account of the most of their *Phænomena* ; particularly he shows, that when a Comet comes down from its *Aphelion*, or when it ascends to it, its Trajectory will seem to be a right Line, and may be assumed as such, when its motions are to be determined without great niceness ; and upon this account, it is that *Kepler* and several others of the Astronomers did really suppose, that they went on still in straight Lines, without ever returning. Their Tayls he takes to be Vapours, which being heated by the Sun, arise copiously from their Bodies when they descend towards it, and are carried upwards by the Air in which they swim : where he takes notice, that if this matter of the Tail (which is spread at a great distance from the Comet itself) should touch and mix with our Atmosphere, may infect

infect it with qualities pernicious to the temperment of our Vegetables and Animals ; and from thence may arise all those effects, which by long observations and common consent of Mankind, have been attributed to Comets, notwithstanding of their being ridiculed by some Modern Philosophers. From this he passes to shew the method by which the Orbits of the Comets are to be determined. The ways he takes, are not only excellent in that case, but likewise of great use in solving other intricate and difficult Problems in Natural Philosophy. And then he gives the way of finding both the Heliocentrick and Geocentrick places of a Comet for any given time, and describes Tables that are necessary for the more ready performance of it.

The 6th and last Book is upon comparative Astronomy where he considers the *Phænomena* that would appear to a Spectator placed in each of the Heavenly Bodies, and compares them with those that are seen from the Earth. The chief of those he takes notice of are their vicissitude and duration of Days and Nights, the apparent Bigness, intenseness of Heat, and light of the Sun, the length of their Years, and variety of Seasons, the phases of the Moon, and the Eclipses of the Luminaries, the Number, Directions, Stations and Retrogradations of the Planets that are to be seen, and the helps they may afford to discover the true System of the Universe. After having given us an account of all these appearances in each of the Heavenly Bodies, he shows us that of all the Primary Planets, the Earth is the fittest place where an observer may discover the true System of the World, and *Mercury* the most unfit for that purpose ; and that therefore an Inhabitant in any one of the Planets, may upon better reasons suppose his own Habitation immovable, and that the whole Heavens turn round about him ; then these which our Terrestrial observers have for their immobility, and having fewer arguments, it will be harder to convince them of their own motion. We may reasonably then imagine, that an Aristotome in any of the other Planets ; as for example in *Venus*, would suppose his own Habitation immovable, and would endeavour

endeavour to make a System to satisfy all *Phenomena's* upon that Scheme. This in his proportion of the Astronomy in *Venus*, he says may be affected from the true System two ways : first, if *Venus* were brought from its place in the true System down to the Center, and the Sun and the rest of the Planets together with their Orbits, advanced as far the same way in parallel Lines, Such a System in *Venus* would be perfectly *Tychonick*, in which the Sun would be made turn round *Venus* in an Orbit equal, and like to that, in which *Venus* does really turn round the Sun, in the true System, and all the Planets, together with their Satellites, besides their being carried round *Venus* by the Sun, would have all the same motions round the Sun, as in the true System. The Orbit of the Earth in this System, would cut the Sphere of the Sun after the same manner, as in the *Mars* intersects the Orbit of the Sun in the *Tychonick* System, which is framed for our Earth, whereas the Orbit *Jupiter* would not cut it, but surround it. The second way, by which an Astronomer in *Venus* may contrive a System to satisfy appearances, and make himself immovable in the Center, is by bringing *Venus* to the Center, and advancing the Sun and all the Planets just as far in parallel Lines, as was done before ; but leaving their Orbits immovable, and the very same which the Planets described round the Sun in the true System. If this were supposed by an Astronomer in *Venus* it would be the *Ptolemaick* System, in which the Sun is carried round *Venus*, placed in the Center of all the Planets Orbits, and such of the Planets move in an Epicycle similar and equal, but in a contrary position to the true Orbit of *Venus* round the Sun, the Centers of the Epicycles being moved in their deferents in the same times that the Planets themselves perform their revolutions in the true System. And a *Ptolemaick* System made in this manner, would satisfy all the Celestial *Phenomena's* equally as well as the *Tychonick* or the true System; so that if the *Ptolemaick* System for the Earth had been thus framed, there could have been no arguments from obser-

servations brought against it ; nor indeed any other way left to convince it of falsehood, but that only which is drawn from the principles of Natural Philosophy.

II. *An Abstract of Dr Mead's Mechanical Account of Poisons sent to the Publisher, by Sam. Morland.*

The first Essay with which the Dr presents us, is concerning the *Viper* and its Poison. His Enquiries were the more necessary here, because the Ancients, as he informs us, terrified both by Superstition, and the danger of such Experiments, have left the Anatomy of these Creatures very imperfect, and consequently have reasoned both loosely and precariously about the nature and effects of its Venome. *Charas*, *Rbedi* and *Dr Tyson* have made great advances in this matter ; but 'tis upon a yet more accurate account of the Structure and Configuration of all those parts that prepare, contain and discharge the deadly Juice that the Dr founds his ensuing reasonings. (Which account you have with the necessary Figures, as drawn up by that Incomparable Anatomist and Learned Physician, *Dr Areskin* at the end of the first Essay.)

The Dr makes no scruple to assert, that the Viper conveys its mischief by the yellow Liquor, which it emits into the Wound, thro' a slit near the extremity of the Tooth. He hath here decided the controversy so long agitated between *Mr Rbedi* and *Charas* in favour of the former, by several so convincing experiments, as that he hath left no room for future doubt or Cavil, making it even plain, that the *Sanes* itself conveyed into a Wound made by incisions, and not by the Vipers Teeth, if it be infused in a sufficient quantity will not

not fail to kill. Tho it may not have the operation, when in tried by an hand too sparing and timerous of success.

That the Creature is furnished with so fatal a Juice, was designed for its own subsistence. Its food being such as it could never digest, unless it immediately killed its Prey. That it hurts any besides, is only by accident, and when they meet it in its angry mood.

Upon the discharging this *Juice* into the Wound, there follow Pains, Swellings first red and then livid ; Faintings, Vomitings, cold Sweats, a change of colour in the Skin, like as in the Jaundice and finally Death, unless the strength of the Patient, or seasonable Medicines prevent.

To account for these *Symptoms*, the Dr thought necessary to examine the Texture of this Juice, which by viewing it thro' an admirable Microscope, he found to be full of little floating Salts, which in a short time shot out themselves into *Crystals* of an incredible tenuity and sharpness, of which whole appearance he hath given a delineation in the Table. With this Juice he made several other experiments, upon the credit of which he blames those that boldly, and without due enquiry affirm, that it is *Alkalions*, that so they may subject a new set of Maladies to the jurisdiction of their admired never failing *Acids*.

It was necessary not only to consider this Juice, but the *Blood* also into which it is conveyed. And therefore the Dr gives us an account of the Doctrine of Fluids, the different cohesions and directions of their Particles upon Mr *Newton's* Principles : Adding what is remarkable in the Blood, which is the Fluid under consideration. Now this consisting of innumerable *Globule's* floating in a Limpid *Serum*. The pointed Salts before-mentioned, are conjectured by the Dr to prick those Globules or little Bladders. Whose hulls or cases thus emptied of their Contents adhere, and are attracted in a manner quite different from what they were before, and so serve to break the Texture of the remaining Blood. Especially, if we consider, that the *Aura* these *Vesiculae* emit may

serve both to drive and convey the *Viperine Spicula* till they have diffused their ill effects over the whole Mass. And thus I have given you an hint of the Drs reasoning about this abstruse Matter. To which I shall only add, that the Dr omits not to acquaint his Reader, that he is of opinion, that these *Spicula* act upon the sensible Membranes in the nature of *Stimuli*, which he explains upon *Bellini's Principles*.

For the Cure he mentions a red hot Iron apply'd to the Wound, the Snake Stones, the *Axungia Viperina*, which he proves to be the grand Secret of the Viper Catchers; and the Vipers Flesh of use the of which he gives a curious account out of the Ancient Physicians and Modern Travels.

In the close of this Essay he gives an account of some other *Poysonous* Animals; as the Spider, in which he hath discovered the Instrument conveying the Poyson, which had escaped the nice diligence of Mr *Leewenhoek* himself; the *Scolopendra*; the *Scorpion*, of which I shall particularize nothing but that when it is reduced to a despair of Life, it wounds itself with its own Sting on the Back and dyes. And that the *Oleum Scorpionum* is a present Remedy for their Stings.

The next Essay is of the *Tarantula* and *Mad Dog*. The *Tarantula* is an *Apulian Spider* of the *Ozonocular* kind, the Figure of which may be seen in *Baglivi's Dissertation*. To which there is one very like described by *Hernandez* by the name of *Hoitztocatl*. It harbours among the Corn and there bites Mowers or Passengers. Upon which bite, especially in Summer Time very odd Symptoms ensue, which require as odd a Cure. For among other effects, which favour of a *Delirium*, of which the Drs gives a particular enumeration, it is very observable, that when the *Tarantati* lye as sometimes they do like Apoplectick Persons, upon the sound of an appropriate Tune they rise up, and Dance till they sweat out the Malady. Which yet returns tho in a weaker Degree, the same Season the next year, and then again yields to the same method of Cure. Most of the Symptoms whic
peh-

precede the Apoplectic State, out of which the Musick raises the person afflicted, having a tang of Madness, gives the Dr occasion to present us with some curious and uncommon Thoughts about a *Delirium*; and to show how these changes which are introduced into the Blood by the bite of the Spider, do dispose the persons to such Actions, as denominate a Man in common Speech delirous. That his Account about these alterations in the Blood is true, appears plain, from what *Baglivi* observed in a Rabbit bitten by the *Tarantula*. But the most ingenious part of this Essay is that, wherein he shews, how Musick may be supposed to contribute to the Relief of those who are thus afflicted. As it works upon the mind, by presenting to it lively *Species* of Joy and Mirth. As it affects the Body not only by exciting to those motions that help them by Sweat and Evacuations, but as the harmonically Vibrating Air, by immediate contact affects the contractile Membranes with such a determinate force, especially those of the Ear, and thereby of the Brain, which assists the contraction of the Fibrils, prevents a beginning Coagulation, &c. Upon which occasion, we meet toward the end of this Essay with a most entertaining account of the several occasions, upon which the Antients called in the assistance of Musick for healing Distempers. This method being used by *Aesculapius*, *Theophrastus*, *Celius Aurelianus*, *Thales of Crete*; as the Dr proves from *Galen*, *Pindar*, *Athenaeus*, *Aulus Gellius* and *Plutarch*. Where there are two remarks too particular to be omitted, one is, that this practice is called *Decantare loca Dolentia*, which is a lucky attestation to one part of the Dr's foregoing reasoning. The other, is, that *Pythagoras* himself, who resided in this part of *Italy* may not improbably be supposed to have introduced this method in this Case.

The Symptoms from the bite of a mad Dog are no less odd, but much more terrifying. Of these Symptoms the Dr hath given us an account, as they have been observed by *Galen*, *Dioscorides*, *Aenis*, *Egineta* and *Celius Aurelia-*

nus ; as also from Dr *Lister* and Dr *Houman*. As for the most of these Symptoms which the Dr with the generality of Authors attributes to a *Delirium*, He accounts for them by the alteration made in the Blood by the *Salva* of the Dog, whose Madness he faith, is the effect of an high Fever. This incorporated with the Arterial Fluid raises an effervescence in the Blood Vessels, especially in the Brain, from whence proceed such disorders, as may easily be supposed to induce a *Delirium* according to the account of this affection given in the former part of the Essays. As to the *Hydrophobia*, the Dr hath advanced a notion, which, however particular it may seem, will I dare say, become general in a short time. For he supposes this to be no part of the *Delirium*, but to arise from the Pain they feel in swallowing Liquor, which Pain is excited, partly by its touching the inflamed Membranes of the *Fauces*, partly because the Liquor fermenting with the active Particles discharged upon the Stomachick Glands twitches and irritates the Membranes. A like instance, to which we have in Colical Cases. But nothing can go farther towards deciding the Case, than to know, as he affirms, that upon whatever occasion the Glands, become thus inflamed the *Hydrophobia* follows, tho there be no Bite in the case. Which he proves from *Skenckius*, *Salmuth*, &c. and observations from dissections.

For the Cure he recommends besides enlarging the Wound, Scarritying, or at least pouing in melted *Unguentum Hægiacum*, all that absorbs a Peccant Humour, or carries it off by Urine. Several Medicines to this purpose he mentions, and among the rest *Lichen Cinereus Terrestris*, whose Efficacy depends upon the aforesaid properties. But above all submerging, of which he gives a brief History, and a Philosophical account of its operation and success.

Essay the 3d, is of Mineral and Vegetative Poisons. *Sublimate* is compounded of *Mercury* and *Common Salt*, which when sublimed, prove one of the most deadly Poisons, tho each com-

compounding Ingredient be perfectly innocent. Of the latter there is no doubt, the innocence of the former he proves by several instances, and the Nature of its operations as a Medicine, in which he declares himself to agree with the Learned Author of the new Theory of Fevers, to whom he refers for a farther account of this matter. The composition becomes destructive, as he most ingeniously informs us, in that the Globules of Mercury which rise in Furne, lodge themselves in the Pores, and Interstices of the Saline Crystals. Now these being like so many sharp Blades wound more forcibly by the addition of this weight of the Mercurial Globules, and more constantly and irresistably, because the Interstices, at which the Stomachiek Juices would otherwise enter and dissolve these wounding Salts, are already possessed by the Particles of Mercury. This account will be the more acceptable to those that read on, till they see how in pursuance of the same principles the Doctor explains (what seems hitherto to have been in vain attempted) the destruction of this corrosive Quality by a second Sublimation.

Next he fetches the Nature of *Arsenick* out of the darkness and obscurity, in which it hath lain till now. And here after an accurate Enumeration of the several kinds both Native and Factitious, having examined upon Chymical Principles its Composition, he accounts for its operation much after the same manner, as for *Sublimate Corrosive*: There being here also cutting Salts and a *Rugalus* to give them weights and force. Only it is to be observed, that the *Sulphur* discoverable in *Arsenick* both by smell and its inflammability, serve as an additional *Vinculum* to the wounding *Spicula*, and by its heat to inflame the Wounds which they have made. He concludes this Essay with wonder at a dangerous custom that hath prevailed among some to wear a bag of this Corrosive Mineral at the pit of the Stomach, as an Amulet against the Plague. Into which he most probably conjectures men were lead, by some ignorant Writers who falsely translited *Darfini* (which signifies Cinnamon, and is recommended by *Arabian*

bian Authors as a preservative) by Arsenick, which in Arabick is called Zarnick.

As for Plants as *Cicuta*, *Aconitum*, *Oenanthe Cicutæ facie succo Viroso*, &c. he imputes their deadly effects to their Corrosive parts, which rarifying the Juices of the Stomach, and wounding it, Nervous Membrane by an easy and intelligible process, induce all those disorders which at last end in death. For beginning their Havock in the Stomach, they draw all parts by degrees into a communication of Pains and Agony.

Here he makes it plain how Mineral and Vegetative Poisons tho of the same kind, work so differently from their different force. And how, tho Mineral Poisons seldom pass the *Primæ Vid*, yet Vegetables often do. This Essay concludes with an ingenious conjecture at the compositions of those Poisons, by which the *Africans* and *Indians* are reported to be able to kill at long distances of time, and some directions about the Cure.

Essay 4. *Opium* he tells us comes under the Head of Narcotic Poisons, tho a noble Remedy exhibited in a proper quantity. To assist our conceptions about the Nature of this, he explains the Nature of Sleep at large, of which I shall only rehearse thus much, that as it concerns the Body, it consists in an easy, and a sort of æquilibrious disposition of the Fluids, and Muscular parts. As to the Mind, in a cessation of such thoughts as we exercise when awake, upon which we reflect, and will to employ our Minds.

After this and a Chymical Analysis of *Opium* itself, he ascribes its efficacy to a *Volatile, Alcaline Salt* intimately mixt with a Sulphurous substance, which he proves at large to act upon the Stomach and the Arterial Fluid itself, and dispose in such a manner as it is disposed when we Sleep. He shews further how by the same Mechanism this Drug easeth Pains, checks Evacuations, causes difficulty of Breathing; but above all, how in too great a quantity it commenceth Poison

son by rarifying the Blood, and enflaming the Stomach to such a degree, that the Vessels can no more recover their tone, which he found to be exactly the case in a Dog, upon which he made the Experiment. For the Cure he recommends Acid Medicines and Lixivial Salts. Generous Wines (the Antients Remedy) help only by dissolving the clammy Resinous parts.

The last Eſlay is of *Venomous Steems and Damps*, in Latin called *Mephites*, from a Syriac Theme signifying to breath. Of this ſort the *Mephitis* of *Hierapolis*, and the *Specus Coricius* were famous of old. They are frequent in Countries that abound with Minerals or Subterraneous Fires. The moſt celebrated of all, is the *Grotta de Cani* near *Naples* in *Italy*, which the Dr hath viſited, and given an accurate deſcription of it. The Fumes which here arife but to a determinate height and then turn downwards, and fall back to the Earth, being drawn into the Lungs, both expell the Air out of the *Veficulae* and poſſeſſing its room, ſtreighten the paſſage of the Blood Vefſels. How this comes to be ſo deſtructive will appear to them, who ſhall attentively read the Theory of Respiration here iſerted, and founded upon Mechanical Principles. He proceeds from hence to treat of Pestilential Fevers, what conſtitution or tempeſtment of Air inclines to them, how the Symptoms appear in their firſt Riſe, Progreſs and Height, concluding with ſome cautions about *Waters*, which as they are ſometimes ſaturated with Metalline, Lapideous or Saline Particles, produce ill conſequences in the Bodies of Men, diſtinguiſhing according to the ſtrength of the Tinctures, or the partiſular nature of the Particles, or the part of the Body wherein they are depoſited.

That the Reader may have a juſt Idea of this performance, I think it neceſſary to add to what hath been ſaid in the extract. That the curioſe Antient and Polite Learning, with which it is well ſtored, is the ſmalleſt part of

its recommendation. And 'tis not doubted, but the Publick when they have pleased and benefitted themselves by perusing these Essays, will agree with me, that their Learned Author was modest, when he said that it was not difficult to say something on these Heads, more tolerable than Authors had before said.

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